

## Alg. 2 Warm Up # 2- 4

1. Solve.

a)  $x^2 + 3x = -2$

b)  $\frac{12}{x} = x + 1$

2.  $f(x) = x^3 - 8$ , find the x- and y- intercepts.

## HW Questions:

1-61. Consider the equation  $4x - 6y = 12$ . *Standard Form.*

a. Predict what the graph of this equation looks like. Justify your answer.

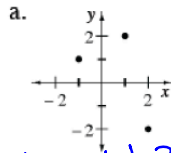
b. Solve the equation for y and graph the equation.

c. Explain clearly how to find the x- and y-intercepts.

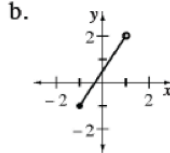
d. Which form of the equation is best for finding the x- and y-intercepts quickly? Why? *Easy to see both intercepts in Standard form.*e. Find the x- and y-intercepts of  $2x - 3y = -18$ . Then use the intercepts to sketch a graph quickly.

*plug in zero for x to find the y-intercept.  
 Plug in zero for y to find the x-intercept.*

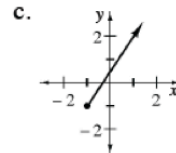
1-62. Name the domain and range for each of the following functions.



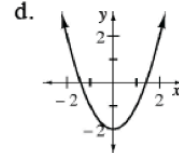
d:  $x = -1, 1, 2$   
r:  $y = 1, 2, -2$



d:  $-1 \leq x < 2$   
r:  $-1 \leq y < 2$



d:  $x \geq -1$   
r:  $y \geq -1$



d:  $x = \mathbb{R}$   
r:  $y \geq -2$

1-63. Find the error in the solution at right. Explain what the error is and solve the equation correctly. Be sure to check your answer.

$$\begin{aligned} \frac{5}{x} &= x - 4 \\ x \cdot \frac{5}{x} &= x - 4 \\ 5 &= x - 4 \\ x &= 9 \end{aligned}$$



$$x \cdot \frac{5}{x} = x(x - 4)$$

$$5 = x^2 - 4x$$

$$0 = x^2 - 4x - 5$$

$$0 = (x - 5)(x + 1)$$

$$x = -1, 5$$

$$-\infty < x < \infty$$

1-66. Graph the following functions and find the  $x$ - and  $y$ -intercepts.

a.  $y = 2x + 3$

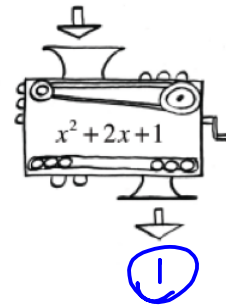
b.  $f(x) = 2x + 3$

c. How are the functions in (a) and (b) the same? How are they different?

Same line!

only the notation is different for  $y$

- 1-75. If the number 1 is the output for Carmichael's function machine shown at right, how can you find out what number was dropped in? Find the number(s) that could have been dropped in.



$$x^2 + 2x + 1 = 1$$

$$x^2 + 2x = 0$$

$$x(x+2) = 0$$

$$x = -2, 0$$

- 1-77. Find the error in the solution at right. Describe the error and solve the equation correctly.

$$3x + 2 = 10 - 4(x - 1)$$

$$3x + 2 = 6(x - 1)$$

$$3x + 2 = 6x - 6$$

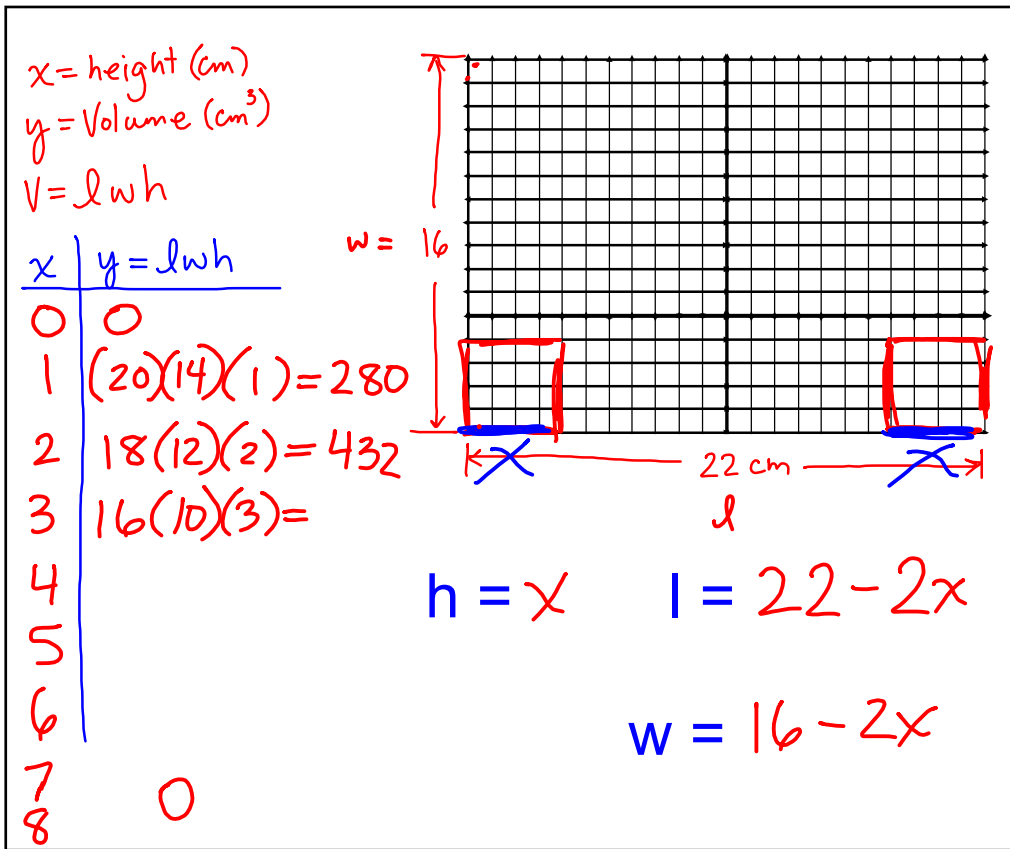
$$8 = 3x \text{ so } x = \frac{8}{3}$$

Need to distribute the -4.



$$x = \frac{12}{7}$$

Pass forward your HW and get out yesterday's CP's



## 1-55. GENERALIZING

Now you will generalize your results. Generalizing is an important mathematical process. A common way to generalize is to write an equation using algebra.

- Draw a diagram of one of your boxes. Since this shape is being used to generalize, you want it to represent a relationship between *any* possible input and its output. Therefore, instead of labeling the height with a number, label the height of this box  $x$ .
- Work with your team to calculate the volume (or  $y$ -value) for a height of  $x$ . It may help you to remember how you calculated the volume when the height was a number and use the same strategy for your new input of  $x$ .

$$h = x \quad l = 22 - 2x \quad w = 16 - 2x$$

$$V = x(22 - 2x)(16 - 2x)$$

$$V =$$

## 1-56. LOOKING FOR CONNECTIONS

Put your  $x \rightarrow y$  table, graph, and equation in the middle of your workspace. With your team, discuss the questions below.

As you address each question, remember to give reasons when you can. Also, if you make an observation, discuss how that observation relates to your table, graph, and equation.

- Is the domain of the relationship limited? That is, are there some input values that would not make sense? Why or why not? How can you tell using the graph? The  $x \rightarrow y$  table? Using the equation? Using the boxes themselves (or diagrams of the boxes)?
- Is the range of the relationship limited? That is, what are all of the possible outputs (volumes)? Are there any outputs that would not make sense? Why or why not?
- Should you connect the points on your graph with a smooth curve? That is, should your graph be *continuous* or *discrete*? Explain.
- What is different about your graph for this problem when compared to others you have seen in previous courses? What special points or features does it have?
- Work with your team to find as many other connections as you can among your geometric models, your table, your equation, and your graph. How can you show or explain each connection?

- 1-57. What graph do you get when you use the graphing calculator to draw the graph of your equation? Explain the relationship between this and the graph you made on your own paper.



$$V = x(22 - 2x)(16 - 2x)$$

$$f(x) = 4x^3 - 76x^2 + 352x + 0$$

$$y =$$

Window -1000?   
 -100

x-min: -6

y-min: -90

x-max: 20

y-max: 1000

x-scl: 2

y-scl: 100

2nd Calculate

value  
zero

TRACE

Classwork Week 2  
will be turned in tomorrow.

Staple together:  
Warm up on top  
1- #26 ---> 30  
1- #41 ---> 44  
Tan #53, 55 - 57

HW: 1-

#59, 64, 68, 69, 71, 76